Listing of Elected Claims:

7. A method for threshold selection in analysis of an image having a plurality of pixels and a plurality of values, each value in the plurality of values corresponding to a respective pixel in the plurality of pixels, the method comprising steps of:

(a) identifying and storing a peak value from the plurality of values;

(b) identifying a pixel in the plurality of pixels corresponding to the peak value and storing a location of the identified pixel;

(c) bounding an area around the location of the identified pixel, the area corresponding in size to an area of a known target image;

(d) excluding from further processing each pixel within the bounded area and the value associated therewith;

(e) repeating steps (a) through (d) until the peak value is less than or equal to an insignificant value;

(f) calculating an average peak value from the stored peak values;

(g) calculating a threshold according to the average peak value;

(h) calculating a number of objects having values exceeding the threshold;

(i) identifying a highest peak value in the determined peak values;

(j) excluding from further processing the current highest peak value and calculating a new average peak value derived from the remaining identified peak values;

(k) calculating a new threshold based on the new peak average;

(l) calculating a new number of objects having values exceeding the new average peak value; and

(m) if the new number of objects is greater than the number of objects, then replacing the number of objects with the new number of objects and repeating steps (j), (k), (l), and (m) until the new number of objects remains constant in value.

8. The method of Claim 7, wherein the insignificant value is determined according to a system noise calculation, the system noise calculation comprising steps of:

determining a brightness range;

selecting a highest value of the brightness range;

determining a subject noise percentage; and

calculating the insignificant value according to the subject noise percentage of the highest value of the brightness range.

9. The method of Claim 7, wherein the insignificant value is determined according to theoretical prediction comprising steps of:

determining theoretical output of values according to an F-distribution;

determining an exponential distribution of values; and

calculating the insignificant value according to a value representing a match between the exponential distribution and the theoretical output.

10. The method of Claim 7, wherein the step of calculating the threshold further comprises a formula:

$T = -\mu \ln(K/N)$,

wherein T represents the threshold, μ represents the average peak value, K represents the predetermined number of false alarms, and N represents the number of identified peak values.

11. The method of Claim 7, wherein the step of calculating the new threshold based on the new peak average further comprises a formula:

$$\hat{T} = -\hat{\mu} \ln(K/N),$$

wherein ^T is the updated threshold, ^μ is the new average value, N is the new number of objects, and K is the predetermined number of false alarms.

12. A method of recognizing a target in an image having a plurality of pixels and a plurality of values, each value in the plurality of values corresponding to a respective pixel in the plurality of pixels, the method comprising steps of:

(a) identifying and storing a peak value from the plurality of values;

(b) identifying a pixel in the plurality of pixels corresponding to the peak value and storing a location of the identified pixel;

(c) bounding an area around the location of the identified pixel, the area corresponding in size to an area of a known target image;

(d) excluding from further processing each pixel within the bounded area and the value associated therewith;

(e) repeating steps (a) through (d) until the peak value is less than or equal to an insignificant value;

(f) calculating an average peak value from the stored peak values;

(g) calculating a threshold according to the formula:

$T = -\mu \ln(K/N)$,

wherein T represents the threshold, μ represents the average peak value, K represents the predetermined number of false alarms, and N represents the number of identified peak values;

(h) calculating a number of objects having values exceeding the threshold;

(i) identifying a highest peak value in the determined peak values;

(j) excluding from further processing the current highest peak value, calculating a new average peak value derived from the remaining identified peak values;

(k) calculating a new threshold according to the formula:

$$\hat{T} = -\hat{\mu} \ln(K/N),$$

wherein ^T is the updated threshold, ^μ is the new average value, N is the new number of objects, and K is the predetermined number of false alarms;

(l) calculating a new number of objects having values exceeding the new average peak value; and

(m) if the new number of objects is greater than the number of objects, then replacing the number of objects with the new number of objects and repeating steps (j), (k), (l) and (m) until the new number of objects remains constant in value.

13. A method of recognizing a target in an image, the method comprising steps of:

(a) acquiring data;

(b) converting the data to an image having a plurality of pixels;

(c) analyzing the plurality of pixels and assigning each pixel a respective value from a plurality of values;

(d) identifying and storing a peak value from the plurality of values;

(e) identifying a pixel in the plurality of pixels corresponding to the peak value and storing a location of the identified pixel;

(f) bounding an area around the location of the identified pixel, the area corresponding in size to an area of a known target image;

(g) excluding from further processing each pixel within the bounded area and the value associated therewith;

(h) repeating steps (d) through (g) until the peak value is less than or equal to an insignificant value;

(i) calculating an average peak value from the stored peak values;

(j) calculating a threshold according to the average peak value;

(k) calculating a number of objects having values exceeding the threshold;

(l) identifying a highest peak value in the determined peak values;

(m) excluding from further processing the current highest peak value and calculating a new average peak value derived from the remaining identified peak values;

(n) calculating a new threshold based on the new peak average;

(o) calculating a new number of objects having values exceeding the new average peak value; and

(p) if the new number of objects is greater than the number of objects, then replacing the number of objects with the new number of objects and repeating steps (m), (n), (o) and (p) until the new number of objects remains constant in value.

20. A system for target recognition in an image having a plurality of pixels and a plurality of values, each value in the plurality of values corresponding to a respective pixel in the plurality of pixels, the system comprising:

a storage medium for storing the image and the plurality of values;

a peak value generator for identifying a number of peak values from the plurality of values, the peak value generator comprising:

an identifier and storage unit for identifying and storing a peak value from the plurality of values and identifying a pixel in the

plurality of pixels corresponding to the peak value and storing a location of the identified pixel;

an area determinator for bounding an area around the location of the identified pixel, the area corresponding in size to the area of a known target image; and

a comparison and repeater module for excluding from further processing each pixel in the plurality of pixels within the bounded area and the value in the plurality of values associated therewith and invoking the identifier and storage unit and area determinator until the peak value is less than or equal to an insignificant value; and

a calculator for calculating an average peak value from the identified peak values derived in the previous step and calculating a threshold according to the average peak value; the number of identified peak values; and a predetermined number of false alarms.

21. The system of Claim 20, wherein the insignificant value further is determined according to a system noise calculation, the system noise calculation comprising steps of:

determining a brightness range;

selecting a highest value of the brightness range;

determining a subject noise percentage; and

calculating the insignificant value according to the subject noise percentage of the highest value of the brightness range.

22. The system of Claim 20, wherein the insignificant value is determined according to theoretical prediction comprising steps of:

determining theoretical output of values according to an F-distribution;

determining an exponential distribution of values; and

calculating the insignificant value according to a value representing a match between the exponential distribution and the theoretical output.

23. The system of Claim 20, wherein calculating the threshold further comprises a formula:

$$T = -\mu \ln(K/N),$$

wherein T represents the threshold, μ represents the average peak value, K represents the predetermined number of false alarms, and N represents the number of identified peak values.

24. The system of Claim 20, wherein calculating the new threshold based on the new peak average further comprises a formula:

$$\hat{T} = -\hat{\mu} \ln(K/N),$$

wherein ^T is the updated threshold, ^μ is the new average value, N is the new number of objects, and K is the predetermined number of false alarms.

38. A computer system for threshold selection in analysis of an image having a plurality of pixels and a plurality of values, each value in the plurality of values corresponding to a respective pixel in the plurality of pixels, the system comprising:

a memory coupled to a processor, the processor operable to process the plurality of values;

(a) identify and storing a peak value from the plurality of values;

(b) identify a pixel in the plurality of pixels corresponding to the peak value and storing a location of the identified pixel;

(c) bound an area around the location of the identified pixel, the area corresponding in size to an area of a known target image;

(d) exclude from further processing each pixel within the bounded area and the value associated therewith;

(e) repeat functions (a) through (d) until the peak value is less than or equal to an insignificant value;

(f) calculate an average peak value from the stored peak values;

(g) calculate a threshold according to the average peak value;

(h) calculate a number of objects having values exceeding the threshold;

(i) identify a highest peak value in the determined peak values;

(j) exclude from further processing the current highest peak value and calculating a new average peak value derived from the remaining identified peak values;

(k) calculate a new threshold based on the new peak average;

(l) calculate a new number of objects having values exceeding the new average peak value; and

(m) if the new number of objects is greater than the number of objects, then replace the number of objects with the new number of objects and repeat the previous four functions until the new number of objects remains constant in value.

39. The computer system of Claim 38, wherein the processor is further operable to:

determine a brightness range;

select a highest value of the brightness range;

determine a subject noise percentage; and

calculate the insignificant value according to the subject noise percentage of the highest value of the brightness range.

40. The computer system of Claim 38, wherein the processor is further operable to:

determine theoretical output of values according to an F-distribution;

determine an exponential distribution of values; and

calculate the insignificant value according to a value representing a match between the exponential distribution and the theoretical output.

41. The computer system of Claim 38, wherein the processor is further operable to calculate the threshold according to a formula:

$$T = -\mu \ln(K/N),$$

wherein T represents the threshold, μ represents the average peak value, K represents the predetermined number of false alarms, and N represents the number of identified peak values.

42. The computer system of Claim 38, wherein the processor is further operable to calculate the new threshold based on the new peak average according to a formula:

$$\hat{T} = -\hat{\mu}\ln(K/N),$$

wherein ^T is the updated threshold, ^μ is the new average value, N is the new number of objects, and K is the predetermined number of false alarms.

43. A computer readable medium for threshold selection in analysis of an image having a plurality of pixels and a plurality of values, each value in the plurality of values corresponding to a respective pixel in the plurality of pixels, the computer readable medium comprising:

(a) a code segment for identifying and storing a peak value from the plurality of values;

(b) a code segment for identifying a pixel in the plurality of pixels corresponding to the peak value and storing a location of the identified pixel;

(c) a code segment for bounding an area around the location of the identified pixel, the area corresponding in size to an area of a known target image;

(d) a code segment for excluding from further processing each pixel within the bounded area and the value associated therewith;

(e) a code segment for invoking the code segment (a) through (d) until the peak value is less than or equal to an insignificant value;

(f) a code segment for calculating an average peak value from the stored peak values;

(g) a code segment for calculating a threshold according to the average peak value;

(h) a code segment for calculating a number of objects having values exceeding the threshold;

(i) a code segment for identifying a highest peak value in the determined peak values;

(j) a code segment for excluding from further processing the current highest peak value and calculating a new average peak value derived from the remaining identified peak values;

(k) a code segment for calculating a new threshold based on the new peak average;

(l) a code segment for calculating a new number of objects having values exceeding the new average peak value; and

(m) a code segment for determining if the new number of objects is greater than the number of objects, and, if so, then replacing the number of objects with the new number of objects and invoking code segments (j), (k), (l), and (m) until the new number of objects remains constant in value.

44. The computer readable medium of Claim 43, further comprising:

a code segment for determining a brightness range;

a code segment for selecting a highest value of the brightness range;

a code segment for determining a subject noise percentage; and

a code segment for calculating the insignificant value according to the subject noise percentage of the highest value of the brightness range.

45. The computer readable medium of Claim 43, further comprising:

a code segment for determining theoretical output of values according to an F-distribution;

a code segment for determining an exponential distribution of values; and

a code segment for calculating the insignificant value according to a value representing a match between the exponential distribution and the theoretical output.

46. The computer readable medium of Claim 43, further comprising a code segment for calculating the threshold according to a formula:

$$T = -\mu \ln(K/N),$$

wherein T represents the threshold, μ represents the average peak value, K represents the predetermined number of false alarms, and N represents the number of identified peak values.

47. The computer readable medium of Claim 43, further comprising a code segment for calculating the new threshold based on the new peak average according to a formula:

$$\hat{T} = -\hat{\mu}\ln(K/N),$$

wherein ^*T* is the updated threshold, ^μ is the new average value, *N* is the new number of objects, and *K* is the predetermined number of false alarms.